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10/567,275

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M. Ian Phillips

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02/09/2009

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GAINESVILLE, FL 32614

EXAMINER

SAJJADI, FEREDOUN GHOTB

ART UNIT

PAPER NUMBER

1633

MAIL DATE

DELIVERY MODE

02/09/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/567,275

Applicant(s)

PHILLIPS ET AL.

Examiner

FEREYDOUN G. SAJJADI

Art Unit

1633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-28 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Pursuant to the preliminary amendment dated February 6, 2006, claims 1-28 are pending in the Application.

Election/Restrictions

Restriction is required under 35 U.S.C. 121 and 372.

1. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-16, drawn to a composition comprising: (a) a first polynucleotide comprising: (1) a gene switch/biosensor comprising a nucleic acid sequence encoding a physiological stimulus-sensitive chimeric transactivator, and (2) an operatively linked tissue-specific promoter; and (b) a second polynucleotide comprising a nucleic acid sequence encoding a stem cell- attracting chemokine.

Group II, claim(s) 17-19 and 21-26, drawn to a method of targeting a stem cell to a target tissue in a subject by *in vivo* gene delivery, the method comprising administering to the target tissue a composition comprising: (a) a first polynucleotide comprising: (1) a gene switch/biosensor comprising a nucleic acid sequence encoding a physiological stimulus-sensitive chimeric transactivator, and (2) an operatively linked tissue-specific promoter; and (b) a second polynucleotide comprising a nucleic acid sequence encoding a stem cell- attracting chemokine.

Group III, claim(s) 17-26, drawn to a method of targeting a stem cell to a target tissue in a subject by *ex vivo* cell therapy, the method comprising administering to the target tissue a composition comprising: (a) a first polynucleotide comprising: (1) a gene switch/biosensor comprising a nucleic acid sequence encoding a physiological stimulus-sensitive chimeric transactivator, and (2) an operatively linked tissue-specific promoter; and (b) a second polynucleotide comprising a nucleic acid sequence encoding a stem cell- attracting chemokine.

Group IV, claim(s) 27, drawn to a composition comprising: (a) a first polynucleotide comprising: (1) a tissue-specific promoter, (2) a nucleic acid sequence encoding a GAL4 DNA-binding domain, (3) a nucleic acid sequence encoding an oxygen-dependent degradation domain (ODD) polypeptide, and (4) a nucleic acid sequence encoding a p65 activation domain; and (b) a second polynucleotide comprising: (1) at least two copies of a GAL4 upstream activating sequence (UAS), (2) a TATA element, and (3) a nucleic acid sequence encoding a stem cell-attracting chemokine.

Group V, claim(s) 28, drawn to a method of targeting a stem cell to a target tissue in a subject, the method comprising administering to the target tissue a composition comprising: (a) a first polynucleotide comprising: (1) a tissue-specific promoter, (2) a nucleic acid sequence encoding a GAL4 DNA-binding domain, (3) a nucleic acid sequence encoding an oxygen-dependent degradation domain (ODD) polypeptide, and (4) a nucleic acid sequence encoding a p65 activation domain; and (b) a second polynucleotide comprising: (1) at least two copies of a GAL4 upstream activating sequence (UAS), (2) a TATA element, and (3) a nucleic acid sequence encoding a stem cell-attracting chemokine.

37 CFR 1.475 (e) states:

“The determination whether a group of inventions is so linked as to form a single general inventive concept shall be made without regard to whether the inventions are claimed in separate claims or as alternatives within a single claim.”

In view of 37 CFR 1.475 (e), Groups II and III are considered a plurality of the inventions listed in claim 17.

Please note that PCT Rule 13.2, no longer specifies the combinations of categories of invention which are considered to have unity of invention. The categories of invention in former PCT Rule 13.2 have been replaced with a statement describing the method for determining whether the requirement of unity of invention is satisfied. Unity of invention exists only when there is a technical relationship among the claimed inventions involving one or more special technical features. The term “special technical features” is defined as meaning those technical features that define a contribution which each of the inventions considered as a whole, makes over the prior art.

The inventions listed as Groups I-V do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

According to PCT Rule 13.2, unity of invention exists only when a shared same or corresponding special technical feature is a contribution over the prior art. The technical feature, which is shared by Groups I-V, is a composition comprising: (a) a first polynucleotide comprising: (1) a gene switch/biosensor comprising a nucleic acid sequence encoding a physiological stimulus-sensitive chimeric transactivator, and (2) an operatively linked tissue-specific promoter; and (b) a second polynucleotide comprising a nucleic acid sequence encoding a stem cell-attracting chemokine.. Groups I-V do not share a special technical feature over the art because the inventions lack an inventive step under PCT Article 33(3) as being obvious over Tang et al. (Hypertension 39:695-698, 2002), in view of Petersen, B. (U.S. Patent Publication No.: 2002/0094327; effective filing date; Nov. 5, 2000). Tang et al. describe a double plasmid system comprising a transactivator plasmid having a hypoxia response element-incorporated promoter, a GAL4 DNA-binding domain and a NF-kB p65 activation domain, that may be used to activate a reporter plasmid (Abstract and Figure 1, p. 696.). Tang et al. further state that the system could be used to improve the activity of tissue-specific promoters (second column, p. 697). Peterson describes a method of modulating the targeting of pluripotent stem cells to a target tissue of a subject by increasing the concentration of SDF-1 alpha protein in the target tissue (Abstract). Peterson states that the mammalian SDF-1 alpha genes, including the human gene are known (paragraph [0030], and may be used as part of a heterologous DNA under the control of a tissue-specific promoter (paragraph [0086]). As the disclosure of Tang et al. and Petersen are directed to increasing the expression of a heterologous nucleic acid under the control of a tissue-specific promoter, it would have been obvious to combine their respective teachings and to substitute the SDF-1 alpha gene of Petersen for the reporter gene of Tang et al.

Therefore, it follows from the preceding analysis that the claimed inventions listed as Groups I-V do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding technical features for the reasons set forth above.

2. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

Kidney, epithelial tissue, endothelial tissue, liver, brain, neural tissue, thymus, and pancreas tissue specific promoters, (as recited in claim 3); or a cardiac-specific promoters: the ventricular form of the MLC-2v promoter, a fragment of the native MLC-2v promoter, alpha myosin heavy chain promoter, and myosin light chain-2 promoter, as recited in claim 6.

CLCN5, rennin, androgen- regulated protein, sodium-phosphate cotransporter, renal cytochrome P-450, parathyroid hormone receptor, kidney-specific cadherin, E-cadherin, estrogen receptor (ER) 3, endoglin, ICAM-2, human phenylalanine hydroxylase (PAH), human C-reactive protein (CRP), human enolase (ENO3), thy-1 antigen, gamma-enolase, glial-specific glial fibrillary acidic protein (GFAP), human FGF 1, GATA transcription factor, or pancreas duodenum homeobox 1 (PDX-1), as recited in claim 4.

Stem cell-attracting chemokines SCF, vascular endothelial growth factor (VEGF), granulocyte colony-stimulating factor (G-CSF), an integrin, or hSDF- 1 alpha, as recited in claim 7.

A chemokine from bone marrow, peripheral blood, brain, spinal cord, dental pulp, blood vessels, skeletal muscle, epithelia of the skin, epithelia of the digestive system, cornea, retina, liver, or pancreas, as recited in claim 11.

Sensitivity to hypoxia or an elevated glucose level, as recited in claim 10.

Viral vectors an adenovirus, an adeno-associated virus, a herpes simplex virus, a lentivirus, or a retrovirus, as recited in claim 13, or a non-viral vector such as a plasmid, as recited in claim 16.

Delivery system microinjection, electroporation, calcium phosphate transfection, DEAE dextran transfection, polylysine conjugates, receptor-mediated uptake system, liposomal delivery, lipid-mediated delivery system, matrix-impregnated delivery system, microparticle encapsulation, intra-cellular targeting ligand, virion-like particles, or viruses, as recited in claim 18.

Target tissue bone marrow, blood, brain, blood vessels, spinal cord, peripheral nerve, skeletal muscle, cornea, retina, lungs, liver, or pancreas, as recited in claim 19.

Applicant is required, in reply to this action, to elect a single species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

The claims are deemed to correspond to the species listed above in the following manner:
Claims 1, 17, 27, 28, and claims dependent therefrom.

The following claim(s) are generic: 1-28.

The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons:

As the technical features kidney, epithelial tissue, endothelial tissue, liver, brain, neural tissue, thymus, and pancreas tissue specific promoters, or a cardiac-specific promoters: the ventricular form of the MLC-2v promoter, a fragment of the native MLC-2v promoter, alpha myosin heavy chain promoter, and myosin light chain-2 promoter, CLCN5, rennin, androgen-regulated protein, sodium-phosphate cotransporter, renal cytochrome P-450, parathyroid hormone receptor, kidney-specific cadherin, E-cadherin, estrogen receptor (ER) 3, endoglin, ICAM-2, human phenylalanine hydroxylase (PAH), human C-reactive protein (CRP), human enolase (ENO3), thy-1 antigen, gamma-enolase, glial-specific glial fibrillary acidic protein (GFAP), human FGF 1, GATA transcription factor, or pancreas duodenum homeobox 1 (PDX-1), stem cell-attracting chemokines SCF, vascular endothelial growth factor (VEGF), granulocyte colony-stimulating factor (G-CSF), an integrin, or hSDF-1 alpha, a chemokine from

bone marrow, peripheral blood, brain, spinal cord, dental pulp, blood vessels, skeletal muscle, epithelia of the skin, epithelia of the digestive system, cornea, retina, liver, or pancreas, sensitivity to hypoxia or an elevated glucose level, viral vectors an adenovirus, an adeno-associated virus, a herpes simplex virus, a lentivirus, or a retrovirus, as recited in claim 13, or a non-viral vector such as a plasmid, delivery system microinjection, electroporation, calcium phosphate transfection, DEAE dextran transfection, polylysine conjugates, receptor-mediated uptake system, liposomal delivery, lipid-mediated delivery system, matrix-impregnated delivery system, microparticle encapsulation, intra-cellular targeting ligand, virion-like particles, or viruses, target tissue bone marrow, blood, brain, blood vessels, spinal cord, peripheral nerve, skeletal muscle, cornea, retina, lungs, liver, or pancreas, linking the members do not constitute a special technical feature as defined by PCT Rule 13.2, particularly since each of the species does not share a substantially common structural feature, the requirement for unity of invention is not fulfilled.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected

process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FEREYDOUN G. SAJJADI whose telephone number is (571)272-3311. The examiner can normally be reached on 6:30 AM-3:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Voitach can be reached on (571) 272-0739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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